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ABSTRACT

A descriptive-correlational study was conducted to determine the extent to which students used the subject matter content taught in the "O" Level School Agriculture Program in Swaziland. The target population was 493 graduating "O" Level agriculture students in Swaziland. Data were collected in a school visit and through a mailed survey monitored to ensure 100 percent response. The questionnaire contained five sections that measured content in the following areas: plants and soil science, livestock and poultry production, farm structures and machinery, management and operation of agriculture business, and personal characteristics. The study found that students enrolled in the program rarely used the information they learned in the program and had low intentions of using it in their future. A number of recommendations were made: ensure that education is integrated with work; employment skills in agriculture should be used as a basis for curriculum content; students should be trained to use the skills taught; and agriculture should be taught as applied science. Further research was also recommended. (Contains 11 references.) (KC)

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SR 69

Summary of Research

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Use of Agricultural Subject Matter by Secondary Students In Swaziland

M. Jethro Simelane and Larry E. Miller

Introduction

Education in Swaziland is composed of formal and non-formal programs. The system is administered by the Ministry of Education, and by private or volunteer agencies. The formal system is comprise of educational programs at the primary, secondary and high school level. The educational system has been greatly influenced by the British system since Swaziland was once a British Protectorate. The entire educational system has been centralized, but divided into regional education offices to facilitate administration. Students have paid a fee for their education from kindergarten through 'O'Level (k - 12 grades), the government provided bursars (scholarship) for higher education students (Figure 1).

The school curriculum had not included agriculture until after independence. The idea of incorporating agriculture into the school curriculum was piloted and implemented by Gooday between 1973 and 1976, and became known as "Schools Agriculture." The idea of agriculture in schools emanated from emerging issues and concerns of the 1920s through the 1970s. During this period, the debate was: should education in Swaziland be for a few or for all; whether quality should be stressed; whether education should be for consumption or production; and how much tradition and modernity should be incorporated (Gooday, 1980)?

When the Schools' Agriculture Program (SAP) was started, the government considered it essential that programs be developed congruent with the local situation. Government enforced the concepts that school programs should be highly practical in nature, should be geared toward self-employment, and should provide the technical background which would enable the more able students to continue to higher education (Ministry of Education, 1985). The idea of enforcing highly practical programs was further illustrated by Athumani (1987) when he stressed that government had to ensure that education was integrated with work. He argued that education was expected to be terminal at any stage and even primary schooling should be complete in itself by preparing pupils for life in the predominantly rural communities.

In view of the need to tie future expansion of secondary level education to manpower requirements and employment opportunities, the National Educational Review Commission Report (1985) recommended that:

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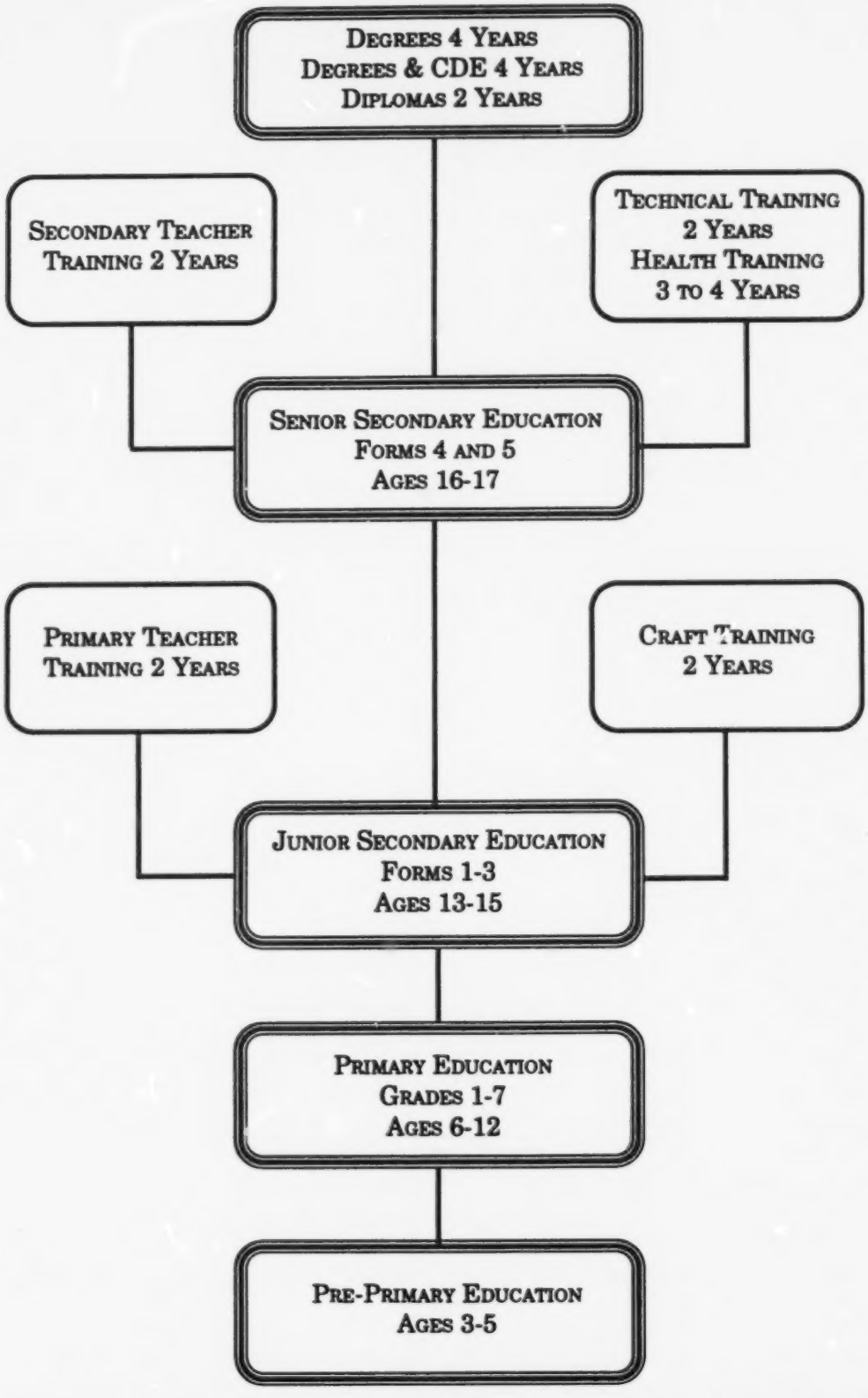
Degrees 4 Years
Degrees & CDE 4 Years
Diplomas 2 Years
Secondary Teacher Training 2 Years
Technical Training 2 Years
Health Training 3 to 4 Years
Senior Secondary Education Forms 4 and 5 Ages 16-17
Primary Teacher Training 2 Years
Craft Training 2 Years
Junior Secondary Education Forms 1-3 Ages 13-15
Primary Education Grades 1-7 Ages 6-12
Pre-Primary Education Ages 3-5

Figure 1. Structure of the formal education system, Kingdom of Swaziland

1. The Ministry of Education introduce subjects which will provide pupils with an education that will prepare them to participate fully in industrial, agricultural and community development.
2. The school program must be diversified to include practical, occupational and subjects like agriculture, home economics and technical trade skills.

At the high school level, agriculture was first introduced as agricultural science, and in 1983 changed to 'O'Level agriculture, which was studied in this research. For years, educational evaluation studies have been based on the paradigm that utilization is a discrete activity which is the responsibility of the potential user (Gube, 1986; National Institute of Education, 1978). However, it became evident that even with the accumulation of more utilization studies and with the improved technological procedures for the transfer and dissemination of knowledge, the frequency and impact of knowledge use did not increase substantially (Rich and Caplan, 1978).

In recent years, awareness has grown that utilization is not a unitary concept but rather (that) there are different types or degrees of utilization (Larsen, 1980; Fullan, 1980). Increasingly, researchers have been acknowledging the alternative forms of utilization and are incorporating them into research and evaluation studies (Larsen, et al., 1976; Yin, et al., 1976; and Dunn, 1980). The purposes of such studies has been to describe more precisely how and to what extent the knowledge was actually implemented.

Utilization is a complex process involving practical, organizational, socio-economic, and attitudinal components in addition to the specific use of information or knowledge. Any study on utilization must recognize the contribution of practical, organizational, socio-economic and attitudinal factors to the eventual use of information. Larsen, in considering the major models for research on knowledge utilization, found that the situation in which knowledge is to be used was of major importance. He stated that "it is impossible to conceptualize the utilization of knowledge without considering the situation in which the utilization of will occur" (1980). Therefore, several appropriate situational factors were included in this investigation and labelled "personological characteristics."

Purpose and Objectives

The major purpose of this study was to determine the extent to which students used the subject matter content taught to them in the 'O'Level Schools Agriculture Program in Swaziland. Research questions providing focus for the study included:

1. Which knowledge and skills of the 'O'Level SAP subject matter content did students intend to use?
2. To what extent did students use the knowledge and skills from the subject matter content?
3. Which section of the syllabus was used more by students?
4. Which knowledge and skills of the subject matter content were currently being used by students?
5. What was the relationship among current and intended use of knowledge and skills of subject matter and students' personological characteristics?

The major purpose of the SAP is to meet the needs of persons who engage in farming or related occupations. The work of the Swaziland Government in communicating improved agricultural practices to farmers and encouraging the adoption of these

techniques through agricultural extension is of vital importance for the improvement of agriculture. Further, the SAP, if taught as a practical art and science on well-developed school farms in the high schools, would be a powerful source of change and improvement in agriculture for the farmers as well as their children who attend high school. Farmers may get advice from their children or visit the schools to ascertain whether or not their children are practicing some of the skills and knowledge.

The importance of this investigation rested with the prospect that educational planners could use the results to strengthen the existing SAP and provide future direction. The identification of useful skills and abilities could be a source of planning information for parents, teachers and teacher preparation institutions.

Procedures

Research Design

The research design in the study was descriptive correlational. This method allowed the research to determine the direction and magnitude of relationships among variables.

Population

The population consisted of all graduating students in the 'O'Level agricultural program in the 16 schools that offered agriculture in Swaziland during the period of April to June 1988. A list of schools offering agriculture was obtained from the office of the Senior Inspector of Agricultural Schools. Frame and selection errors were controlled by getting an up-to-date list of schools offering 'O'Level agriculture. The study involved all schools offering agriculture at 'O'Level and all graduating students enrolled in agriculture were studied, hence sampling error was not a threat to validity. The total population for the study was 493 graduating students doing 'O'Level agriculture. Thirty (30) parents were randomly selected by using the list of students. Two students were systematically picked from each school and their parents interviewed to provide cross-validation to the responses of their children.

Data Collection

Two methods of data collection were used. The bulk of the data were collected from students using a self-administered questionnaire. Additional data were collected through interviews with parents. Data were collected during the months of April to June, 1988. The target population were 493 graduating 'O'Level agriculture students in Swaziland. After the initial visit by the researcher to the school to collect data in a group setting, copies of the instrument were left with the agriculture teacher at each school to administer to those students who were not present on the day of the visit by the researcher. A return addressed, stamped envelope was provided to each teacher for their convenience. This was done to control non-response error and produced a response rate of 100%.

Instrumentation

An instrument was developed using the Kreb's model (1969) of evaluation. Students were asked to indicate using a five-point, anchored, Likert-type scale, their perceived "Use" of the subject matter content from the 'O'Level course of study.

The questionnaire contained five sections:

1. Part I items measured content pertaining to plants and soil science.
2. Part II items measured content relating to livestock and poultry production.

3. Part III items measured content dealing with farm structures and machinery.
4. Part IV items measured content related to management and operation of agricultural business.
5. Part V items measured personological characteristics.

The questionnaire consisted of close-ended items and scales. The anchored rating scales were as follows:

Current Use	Intent to Use
1 = Never used	A = Intend to use
2 = Seldom used	B = Do not intend to use
3 = Sometimes used	
4 = Often used	

Content validity was established by a panel of experts who reviewed the instrument. Suggestions were implemented and the instrument revised accordingly. The instrument was pilot-tested using first-year students enrolled in the two-year program in agricultural education, Faculty (college) of Agriculture, University of Swaziland, to determine reliability. Measures of internal consistency were determined using Cronbach's alphas. Coefficients from the pilot test ranged from .71 to .97 and those from the actual study ranged from .71 to .90.

Data Analysis

Descriptive statistics (frequencies and percentages) were used to organize and summarize the data. Relationship among variables were established by using Chi-Square, Cramer's V, and Phi Coefficients to determine the direction and magnitude of the relationships.

Findings of the Study

Current Use of Subject Matter Content by Students

As shown in Table 1, students in the 'O'Level SAP in all four areas of the syllabus reported that they rarely used the skills and knowledge taught in the program. However, the plants and soil science section of the program was rated higher in use by students than livestock production, agricultural mechanics and agricultural business.

Intended future use of subject matter content, as illustrated in Table 2, revealed that the majority (308) of the students did not intend using the skills and knowledge taught in all four sections of the program. However, the management and operation of agricultural business was rated higher (44%) than the other sections insofar as intent to use was concerned. The agricultural mechanics was rated second (41%) with plants and soil science (25%) and livestock production (24.6%) rated third and fourth, respectively.

Students who reported, Table 3, that land availability was a limitation used the knowledge and skills more often than those who stated land availability was not a problem. Students who did not live with an elderly male family member stated they use the plants and soil science knowledge and skills more often than those who had an elder male family member in residence. In the Swazi culture it is not common for elderly people to immediately accept information from the young. Agricultural education in high schools is a new subject hence parents would expect very little from it.

Livestock production knowledge and skills tended to be used more often by students of ages 17 and 19 than those 14 to 16

Table 1

CURRENT USE OF THE KNOWLEDGE AND SKILLS GENERALLY TAUGHT IN THE 'O'LEVEL AGRICULTURAL PROGRAMS (N=493)

	Extent of Use									
	Never Used		Seldom Used		Sometimes Used		Often Used		Total	
	f	%	f	%	f	%	f	%	f	%
1. Plants and Soils	1	.2	125	27.5	303	66.7	25	5.5	454	100
2. Livestock and Poultry and their Products	62	13.2	199	42.3	185	39.4	24	5.1	470	100
3. Agricultural Mechanics	50	10.5	185	38.9	179	37.6	62	13.0	476	100
4. Management and Operation of Agricultural Business	78	16.6	185	39.4	163	34.7	44	9.4	470	100

Table 2

FREQUENCIES AND PERCENTAGES OF STUDENTS REGARDING INTENDED USE OF THE KNOWLEDGE AND SKILLS TAUGHT IN THE 'O'LEVEL AGRICULTURE PROGRAM (N=493)

	Intend to Use		Do Not Intend to Use		Total	
Domain	f	%	f	%	f	%
1. Plants and Soils	28	25.0	84	75.0	112	100.0
2. Livestock and Poultry and their Products	28	24.6	86	75.4	114	100.0
3. Agricultural Mechanics	56	41.2	80	58.8	136	100.0
4. Management and Operation of Agricultural Business	53	43.8	68	56.2	121	100.0

or 20 to 24 years old. Students from rural areas reported using the knowledge learned from livestock production more than those from semi-rural or urban areas. Agriculture is most commonly practiced in the rural areas of Swaziland. Students coming from farm homes practicing mixed farming had a better chance of using the livestock production knowledge than those from specialized farms. This might be due to the fact that very few farmers in Swaziland specialize.

Most families in Swaziland depend on some form of agriculture to make a living and as a source of income. Students did not see money as a constraint for them to use the agricultural information learned from high school. Students who did not have land had higher intentions to use information learned in agricultural mechanics than those who had access to land.

Information learned from management and operation of agricultural business was rated with high intentions by students from mixed farms. Students coming from rural areas saw possibilities in using the information learned from agricultural management.

Relationship among Use and Personological Characteristics

The relationships among each of the personological characteristics of students and their current use and/or intended use of the knowledge and skills learned from the high school agriculture program were identified and described. Cramer's V Correlation Coefficients and Phi Correlations Coefficients were used to describe the magnitude of the association. Table 4 revealed negligible to moderate relationships existed among the personological characteristics and the current use and/or intended use of subject matter.

Conclusions

Students enrolled in the 'O'Level SAP rarely used the information they learned in the program and had low intentions of using it in their future.

Recommendations

Based on the findings of the study the following recommendations were made:

1) The Ministry of Education and Curriculum Development Centre should ensure that education has been integrated with work.
2) Skills needed for employment in existing agricultural occupations should be used as a basis for curriculum content.
3) The SAP should be designed to prepare high school leavers to use the knowledge and skills while currently enrolled in the program and after completion.
4) The purpose of 'O'Level training is not to return to the farm but to advance to college.
5) The SAP should be taught as an applied science.

Suggestions for Further Research

The following suggestions for further research are forwarded:

1) A study identifying the knowledge and skills needed in the total agriculture industry should be conducted to provide information for developing curricula that would be more relevant to the employment opportunities in the agriculture sector.
2) A study of similar purposes and design should be conducted regarding

Table 3

ASSOCIATION (x^2) OF STUDENTS' PERSONAL CHARACTERISTICS WITH AGRICULTURAL CONTENT AREAS TAUGHT IN THE 'O'LEVEL AGRICULTURE PROGRAM

	Agricultural Content Area							
	Plant and Soil Science		Life Stock Production		Agricultural Mechanics		Management & Operations of Agricultural Business	
Characteristics	Used	Intent	Used	Intent	Used	Intent	Used	Intent
Gender	1.44	0.01	1.34	0.86	2.94	0.34	3.43	0.06
Age	12.14	5.91	14.27*	9.66	38.87	6.48	25.66	3.11
Home area	6.48	0.49	14.27*	0.16	10.23	1.21	5.74	7.69*
Type of school	3.17	1.58	2.20	0.09	8.13*	0.01	2.65	2.60
Type of farming at home	19.03*	1.43	23.36*	1.61	12.34	5.84	12.57	7.28*
Level of education of mother	12.73	5.16	17.08	1.46	9.47	4.55	22.90	4.27
Level of education of father	17.09	5.01	12.74	5.10	9.47	5.26	15.21	12.68
Occupation of mother	23.50	10.72	29.38	10.86	22.71	8.46	25.88	12.53
Occupation of father	20.39	11.73	35.35	9.86	34.58	12.69	32.23	17.12
Order of birth at home	11.45	5.34	7.28	1.22	8.25	2.54	7.77	2.56
Land availability	18.43*	0.01	15.31	0.02	7.57	4.56*	5.05	0.53
Financial condition	2.87	0.15	5.41	0.96	15.14	0.00	8.35*	0.00
Elder male family in residence	9.67*	0.03	3.82	0.01	1.56	0.00	3.53	0.37
Location of school	1.34	0.00	3.82	0.21	1.21	0.00	1.16	6.18*

*$p<.05$

Table 4

RELATIONSHIP BETWEEN STUDENTS' CURRENT USE AND/OR INTENT TO USE SUBJECT MATTER CONTENT STUDENTS' PERSONAL CHARACTERISTICS

	Agricultural Content Area							
	Plant and Soil Science		Life Stock Production		Agricultural Mechanics		Management & Operations of Agricultural Business	
Characteristics	Used	Intent	Used	Intent	Used	Intent	Used	Intent
Gender	.06	.01	.05*	.11	.08	.78	.91	.04
Age	.10	.23*	.16	.29	.17	.22*	.14	.16*
Home area	.09	.71*	.12	.04*	.10	.10*	.08	.25*
Type of school	.08	.12	.07	.04	.13	.03	.08	.16
Type of farming at home	.15	.11*	.16	.12	.12	.21*	.12	.25*
Level of education of mother	.10	.22*	.11	.11*	.12	.18*	.13	.19*
Level of education of father	.11	.21*	.10	.21*	.03	.20*	.11	.33*
Occupation of mother	.14	.33*	.15	.32*	.13	.26*	.14	.33*
Occupation of father	.14	.36*	.18	.33*	.17	.34*	.17	.40*
Order of birth at home	.09	.22	.07	.11	.10	.14	.08	.15
Financial condition	.08	.06*	.11	.12*	.18	.00*	.14	.00*
Land availability	.20	.01*	.18	.04*	.13	.20*	.11	.09*
Elder male family in residence	.15	.02*	.09	.01*	.06	.00*	.09	.07*
Location of school	.16	.02*	.11	.07*	.05	.02*	.05	.25*

NOTE: Cramer's V correlation coefficients except for Phi coefficients as asterisked(*).

the extent to which students, after completing high school, use the knowledge and skills from their high school agricultural program.

3) A study should be undertaken examining the patterns and levels of knowledge and skills actually taught to and learned by the students.

4) A need exists to conduct several longitudinal studies regarding the acquisition and use of subject matter content taught in the high school agricultural program.

5) There is a need to further examine the home farms as a setting for teaching students about agriculture.

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SUMMARY OF RESEARCH SERIES

The extent to which students use or implement the information or knowledge delivered in an agricultural educational program is powerful information in the hands of educational planners as they revise the existing educational program and make it more relevant. The methodology used in this study to determine knowledge utilization can be useful to educational administrators and planners as they revise educational programs.

This summary is based on a dissertation by M. Jethro Simelane under the direction of Larry E. Miller. M. Jethro Simelane was a graduate student in the Department of Agricultural Education at The Ohio State University. He is currently the Head of the Department of Agricultural Education and Extension at the University of Swaziland. Dr. Larry E. Miller is a Professor, Department of Agricultural Education, The Ohio State University. Special appreciation is due to Maynard J. Iverson, The University of Georgia; Gary Leske, University of Minnesota; and Robert Agunga, The Ohio State University for their critical review of the manuscript prior to publication.

Research has been an important function of the Department of Agricultural Education since it was established in 1917. Research conducted by the Department has generally been in the form of graduate theses, staff studies, and funded research. It is the purpose of this series to make useful knowledge from such research available to practitioners in the profession. Individuals desiring additional information on this topic should examine the references cited.

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